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ABSTRACT

Educational policy makers have questioned the effects of school reform on at-risk students and suggested that higher academic standards may be associated with greater numbers of dropouts. This study examines school average dropout rates for 2 consecutive years in conjunction with percent aid to families with dependent children (AFDC), total enrollment, academic achievement, and academic course enrollments for all of California's regular public high schools. The data reflect the 1985-86 and the 1986-87 school years. Most of the high schools involved contain grades 9 and above, but they may infrequently include grades 7 and 8 as well. Both percent AFDC and total enrollment were associated with higher dropout rates. Higher achievement was associated with lower dropout rates even after statistically controlling percent AFDC and total enrollment. The year-to-year stability of school dropout rates and their correlations with other study variables were assessed. The findings suggest that school effectiveness measures that result in higher achievement may also enhance the effectiveness of dropout treatment programs. Three tables and one figure present dropout information. (Author/SLD)

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School Dropout Rates, Academic Performance, Size, and Poverty: Correlates of Educational Reform

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Abstract

Educational policy makers have questioned the effects of school reforms on at-risk students. Are higher academic standards associated with greater numbers of dropouts? This study examines school average dropout rates for two consecutive years in conjunction with percent AFDC, total enrollment, achievement, and academic course enrollments for all of California's regular public high schools. Both percent AFDC and total enrollment were associated with higher dropout rates. Higher achievement was associated with lower dropout rates even after statistically controlling percent AFDC and total enrollment. The year to year stability of school dropout rates and their correlations with the other study variables are assessed. The findings suggest that school effectiveness measures which result in higher student achievement may also enhance the effectiveness of dropout treatment programs.

School Dropout Rates, Academic Performance, Size, and Poverty: Correlates of Educational Reform

Educational reform in California and other states has aimed at more rigorous academic standards. McDill, Natriello, and Pallas, (1985), the California Assembly Office of Research, (1985), the California Department of Education, (1986), and Hamilton, (1986), have speculated that higher standards may result in higher achievement for some students, at the cost of a narrower curriculum and increased probability of dropping out for at-risk students. Decisions to leave school are made by individuals in response to particular circumstances, and dropout prevention programs frequently address the problems of particular individuals. (Ekstrom, Goertz, Pollack and Rock, 1986; Rumberger, 1987; Venezky, Kaestle and Sum, 1987) Of course, these particular individuals and programs exist within a larger school environment. Research on exemplary schools, (e.g., Miller, 1985), suggests that the characteristics of a school, taken as a unit, can influence the performance of students, considered in the aggregate. A process of reform implementation which is sensitive to issues of school leadership, climate, and academic expectations might well result in higher attainment for most students without incurring higher dropout rates.

Although considerable attention has been focused on the etiology of dropping out for individuals, research on factors associated with school dropout rates is relatively scarce. One problem has been the lack of a

common definition of "dropout" and standards for collecting data across school districts. (Hammack, 1986; Williams, 1987) Another problem is the relative lack of information on the stability over time of school dropout rates and associated background variables. Given the difficulty of collecting dropout information, an assessment of stability is helpful in evaluating research findings.

Size and poverty level are two school background variables which have been investigated so far. Cibulka (1986) found that size and poverty level of Wisconsin school districts correlated with dropout rates. Toles, Schulz and Rice (1986) ranked dropout rates for Chicago high schools after accounting for gender, race, age and achievement. Pittman and Haughwout (1988) suggested that the relationship between dropout rates and school size is attributable to school climate, in particular, student participation and crime.

This study seeks to extend the scope of the prior research beyond size and poverty level to consider in addition two measures of school performance, i.e., achievement and academic course enrollments. Several questions are addressed. (1) How stable over time are school dropout rates compared to measures of poverty, size, achievement and academic course enrollment? What are the implications for research? (2) Can the relationship between the dropout rate, school size, and poverty found in past studies be replicated? (3) After accounting for size and poverty, do schools with higher achievement or levels of academic course enrollment also have higher dropout rates? What might this suggest with regard to educational reform?

Method

Sample Included in this study are all regular, comprehensive, public high schools in California. Most of these high schools contain grades nine and above, but may infrequently include grades seven and above. Not included here are private schools, continuation high schools for at-risk students, or schools maintained by county offices for special-needs students.

Data Sources. The California State Department of Education maintains a school performance data base to help track the success of reform implementation. (Fetler, 1987) Achievement test scores were provided by the California Assessment Program (CAP), and demographic statistics by the California Basic Educational Data System (CBEDS). The data reflect the 1985-86 and the 1986-87 school years. The measures used here reflect general aspects of school performance, and as such do not support inferences about causal processes in individuals or inferences about the effectiveness of particular programs. Definitions of the variables analyzed here follow.

- Dropout Rate (DOR). Students missing from school at least 45 days without a request for a transcript are recorded as dropouts. The numbers of dropouts in grades 10, 11 and 12 cumulated over a calendar year are summed and divided by the total enrollment in those grades to compute a school's overall dropout rate.

- Aid to Families with Dependent Children (AFDC). The number of students covered by AFDC in a school attendance area is divided by the total number of students to compute this measure of poverty.

- Total Enrollment (ENR). The total student enrollment in grades 10, 11, and 12 is used a proxy for school size.

- Average Achievement (ACH). Twelfth grade student percent correct on the standardized CAP reading and mathematics tests is averaged to compute an overall measure of school mean achievement. Student participation in the examination averages 95 percent.

- A-F Enrollment in Academic Courses (AFE). School teachers report enrollment in courses which are accepted by the University of California as meeting subject requirements for admission. (The required course sequence has six components, labeled "a-f.") The sum of enrollments in all classes which meet the a-f criteria is divided by the sum of enrollments in all classes to compute an overall school rate of academic course enrollment.

The correlational analyses were weighted by the average of the 1985-86 and the 1986-87 total enrollments. Descriptive statistics and correlations are displayed in Table 1. The results of two regression models, one for each year, are shown in Table 2. Figure 1 is a scatterplot of school dropout rates versus achievement after removing the effects of AFDC and total enrollment. Two years of data were combined to produce means for the dropout rate, achievement, total enrollment, and AFDC. Achievement and

dropout residuals were computed in regressions which used AFDC and total enrollment as predictors and the residuals were used to construct the plot displayed in Figure 1.

Results

Means, standard deviations and correlations are displayed in Table 1. The year to year correlations are first examined for the light they shed on the stability of the various school measures used here. The pattern of correlations within years is reviewed and the stability of the pattern across years is discussed.

Insert Table 1 about here.

Examination of the statewide weighted averages in Table 1 revealed small differences over time with no difference attaining statistical significance. Correlations with absolute values greater than .1 were statistically significant, ($p < .01$). (N.B. Even though the smaller correlations are statistically significant, they may have little practical significance.) Relatively high year to year weighted correlations were obtained for total enrollment (ENR) and AFDC. These two measures require only an objective counting of students and rely on well established data collection systems. The correlation for achievement was relatively high, despite the testing of a new cohort of students each year. This probably reflects uniform testing procedures, relative stability of the student characteristics within schools, and reliable estimates of achievement.

The relatively lower correlation for the dropout rate, r = .73, may reflect either difficulties in collecting dropout information (measurement error), or an underlying instability of the dropout rate itself. Accumulating dropout totals requires the labor intensive tracking of individuals in and out of schools with much potential for error. On the other hand, dropping out is the result of individuals' decisions, made in reponse to various factors in the home, the community and the school which may affect stability. Although a detailed assessment of the factors affecting instability is beyond the scope of this study, the dropout rate is stable enough for research use with the sample of schools available here.

The weighted correlation for a-f enrollment, r = .65, was the lowest of those investigated. Because the stability of a measure limits the magnitude of its correlation with other measures, the relative lowness should be noted. Again, the question may be posed as to the reasons for the relative instability of this measure. Student decisions to take courses, like the decision to dropout, are presumably influenced by many environmental factors. Although there is potential for reporting errors, teachers have routinely provided these data since 1984, and schools have certified the a-f status of courses for many years.

Within year dropout rates correlated positively with AFDC and total enrollment and negatively with achievement and a-f course enrollment. School socioeconomic background may be mediating these relationships. Total enrollment is itself positively and achievement is negatively

correlated with AFDC. This general pattern of correlations holds across years, even though the magnitudes of the correlations vary somewhat.

The correlations of the dropout rate with percent AFDC, total enrollment, and achievement were relatively stable across years. Higher dropout rates were associated with larger enrollments and higher levels of AFDC. By contrast, higher achievement was associated with lower dropout rates. It seems likely that the relationship of dropout rate with achievement is mediated at least in part by the relative poverty of the school. Support for this hypothesis is found in the negative correlation between percent AFDC and achievement. The correlation of the dropout rate with a-f enrollment, although negative both years, was smaller than the other correlations. The relatively unstable correlation between dropout rate and a-f enrollment may be partly attributable to the relatively low year to year correlation of a-f enrollment with itself.

Insert Tables 2 and 3 about here.

Considered together, about half the variance of the dropout rate was accounted for by percent AFDC, total enrollment, achievement, and academic course enrollment. R-square was .47 for the 1986-87 regression shown in Table 2 and .51 for the the 1985-86 regression in Table 3. The regressions confirmed the negative relationship of AFDC and total enrollment with dropout rate, although the weights for these variables varied somewhat across years. The weights for achievement were large compared to the other variables, and were stable across years. Results suggest that high

achievement is associated with lower dropout rates even after statistically controlling for the background variables. Academic course enrollment was not significantly related to achievement.

Insert Figure 1 about here.

The scatterplot in Figure 1 provides more detail on the relationship between achievement and dropout rate after controlling for the background variables. Using linear regression, percent AFDC and total enrollment were partialed from achievement and the dropout rate. The residuals were divided by their standard errors to standardize them. Fifteen dropout residuals and six achievement residuals with absolute values greater than 3.0 were not plotted in order to maintain a reasonable scale for the display. The correlation, $r = -.44$, $(p < .001)$, between the dropout and achievement residuals is consistent with the generally negative slope of the plot.

Discussion

Stability of measurement should be addressed in research on school dropout rates. The collection of dropout data can be particularly reactive in that having any dropouts is likely to be perceived negatively by school officials and by the public. Because dropout reporting calls for tracking of students it is relatively labor intensive and one frequently hears anecdotes about faulty record keeping. Unfortunately, it is not possible to objectively evaluate the actual extent of reactivity or the generality of such anecdotes. A measure of stability, such as the year to year

correlation reported in this study, is an objective means of evaluating the quality of the data. The stability coefficient obtained here for the dropout rate, although not as high as the coefficients obtained for AFDC, total enrollment, and achievement, is sufficient for correlational research on a sample of the size used here. It may not be sufficient for the identification and study of small groups of schools, especially if the dropout rate is used by itself without other confirming information.

A potential dilemma for school reform is that the raising of performance standards and the increased emphasis on an academic curriculum may benefit traditionally high achieving students while discouraging at-risk students. Under this view, successful school reforms could well be associated with higher dropout rates, higher achievement, and more participation in academic courses. High dropout rates might speciously contribute to higher attainment by eliminating low performing students who could bring down the average performance level.

The results of this study do not support the hypothesis that higher levels of achievement or academic course enrollments are associated with higher dropout rates. It is not surprising that schools with higher achievement have lower dropout rates. Presumably this relationship is mediated in part by socioeconomic factors. A more interesting finding is that higher achievement is associated with lower dropout rates even after statistically controlling for AFDC and total enrollment. One interpretation is that the same factors which encourage higher achievement also encourage lower dropout rates, independent of social background. One can speculate that traditional school effectiveness, measures (e.g.,

administrative leadership, positive school climate, and reasonably high expectations) could play a role in the implementation of reforms. The data available here do not permit an examination of the processes used to implement reforms, but it is possible that a strategy which is sensitive to the needs of all students in a school will be more successful than an insensitive strategy. In particular, a more sensitive strategy might result in both higher achievement and lower dropout rates. Under this view the reform itself is less strongly related to dropout rates than is the process of implementation.

A study by Policy Analysis for California Education (PACE), (1988), of school reform in California documents a recent narrowing of the curriculum. Between the 1981-82 and 1986-87 school years there were statewide increases in academic enrollments, balanced by declines in remedial courses and electives. PACE conducted case studies of fifteen diverse schools which had successfully implemented mandated reforms. Key themes of school level implementation were a focus on an improved learning environment, heightened concern for all students, teacher collegiality, and teacher and site administrator participation in designing implementation activities. In most of these schools additional measures had been taken to help at-risk students. Increased dropout rates were not associated with educational reform in these schools. The findings for achievement and a-f course enrollments appear to be consistent with PACE's case-study findings.

Results for the demographic background variables are consistent with statements in the literature that higher dropout rates are more likely in larger schools and poorer neighborhoods. The relationship between measures

of socioeconomic status and school performance has long been documented, (White, 1982), and is reconfirmed here for achievement and the dropout rate. One traditional argument for larger schools is that economies of scale can be realized which promote the more efficient use of funds. On the other hand, schools are complex institutions and greater size may incur administrative difficulties. Larger size would not necessarily facilitate the handling of problems associated with discipline, safety, collective bargaining, community involvement, etc. The results here hint that that larger size could increase the difficulty in providing effective dropout prevention services. The identification of the negative consequences of size and of ways to overcome them would be a useful extension of this research.

While non-school socioeconomic and demographic factors are associated with dropout rates, they should not be offered as an excuse for defeatism. It is incorrect to draw the conclusion that educators can do little about poverty and therefore must live with the associated dropout problem. One of the original motivations for the latest round of school reforms was the conviction that the educational system needed improvements, i.e., that high dropout rates, whatever their causes, are unacceptable. A premise of school effectiveness methods is that the effects of poverty can be fought. One can speculate that effective leadership, positive school climate and reasonable expectations for all students could enhance the effects of specific dropout treatment programs. The results of this study illuminate the possibility that general school effectiveness techniques can be used to ameliorate dropout rates even in a reform environment.

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TABLE 1: CORRELATION OF DROPOUT RATE WITH AFDC, SIZE, ACHIEVEMENT, AND ACADEMIC COURSE ENROLLMENT

	DOR67	AFDC67	ENR67	ACH67	AFE67	DOR56	AFDC56	ENR56	ACH56	AFE56
MEAN	6.06	10.74	1548	66.22	44.71	7.11	11.02	1527	65.14	44.19
STD	194.2	418.2	21791	193.3	394.6	228.5	445.9	21758	201.6	349.1
N	789	789	789	789	789	772	784	789	789	778
DOR67	1.00	0.60	0.36	-0.65	-0.11	0.73	0.60	0.36	-0.65	-0.17
AFDC67	0.60	1.00	0.17	-0.71	-0.21	0.52	0.97	0.16	-0.72	-0.24
ENR67	0.36	0.17	1.00	-0.24	0.06	0.42	0.17	0.99	-0.23	0.11
ACH67	-0.65	-0.71	-0.24	1.00	0.31	-0.61	-0.69	-0.22	0.94	0.40
AFE67	-0.11	-0.21	0.06	0.31	1.00	-0.12	-0.18	0.09	0.29	0.65
DOR56	0.73	0.52	0.42	-0.61	-0.12	1.00	0.51	0.41	-0.62	-0.20
AFDC56	0.60	0.97	0.17	-0.69	-0.18	0.51	1.00	0.16	-0.71	-0.22
ENR56	0.36	0.16	0.99	-0.22	0.09	0.41	0.16	1.00	-0.22	0.15
ACH56	-0.65	-0.72	-0.23	0.94	0.29	-0.62	-0.71	-0.22	1.00	0.38
AFE56	-0.17	-0.24	0.11	0.40	0.65	-0.20	-0.22	0.15	0.38	1.00

TABLE 2: REGRESSION OF 1986-87 DROPOUT RATE ON BACKGROUND AND PERFORMANCE VARIABLES

VARIABLE	PARAMETER ESTIMATE	PROB > |T|	STANDARDIZED ESTIMATE
INTERCEP	28.52	0.0001	0.00
AFDC67	0.13	0.0001	0.28
ENR67	0.002	0.0001	0.20
ACH67	-0.43	0.0001	-0.43
AFE67	0.04	0.0059	0.07

TABLE 3: REGRESSION OF 1985-86 DROPOUT RATE ON BACKGROUND AND PERFORMANCE VARIABLES

VARIABLE	PARAMETER ESTIMATE	PROB > |T|	STANDARDIZED ESTIMATE
INTERCEP	35.57	0.0001	0.00
AFDC56	0.07	0.0002	0.14
ENR56	0.003	0.0001	0.29
ACH56	-0.50	0.0001	-0.44
AFE56	-0.03	0.1499	-0.04

FIGURE 1: PLOT OF DROPOUT AND ACHIEVEMENT RESIDUAL SCORES

NOTE: ONE OBSERVATION IS DENOTED BY AN "A", TWO OBSERVATIONS BY A "B", ETC.